

**Spring 2007
Industry Study**

**Final Report
*Reconstruction & Vital Infrastructure***



JCAF

The Industrial College of the Armed Forces
National Defense University
Fort McNair, Washington, D.C. 20319-5062

The analysis and opinions expressed or implied herein are solely those of the members of the respective Industry Studies Seminars based upon their experience, observations, and study and do not represent the views of the National Defense University or its constituent colleges, the Department of Defense, or any other U.S. Government agency. This material does not imply Department of Defense endorsement of factual accuracy or opinion.

Report Documentation Page			Form Approved OMB No. 0704-0188	
<p>Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p>				
1. REPORT DATE 2007	2. REPORT TYPE	3. DATES COVERED 00-00-2007 to 00-00-2007		
4. TITLE AND SUBTITLE 2007 Reconstruction & Vital Infrastructure		5a. CONTRACT NUMBER		
		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)		5d. PROJECT NUMBER		
		5e. TASK NUMBER		
		5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) The Industrial College of the Armed Forces,National Defense University,Fort McNair,Washington,DC,20319-5062		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)		
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 37
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	19a. NAME OF RESPONSIBLE PERSON	

RECONSTRUCTION & VITAL INFRASTRUCTURE 2007

ABSTRACT

Since the end of the Cold War, the United States has engaged in a new post-conflict rebuilding operation every 18 months on average (Orr, 2004, p. X). The demands on the United States to respond to the needs of failing states, countries emerging from conflict, or regions recovering from natural disasters are likely to continue.

The Reconstruction and Vital Infrastructure (R&VI) Industry is best viewed within three distinct markets: (1) Post-conflict reconstruction, such as the rebuilding of Iraq and Afghanistan following combat operations. (2) Development of failed or failing states, such as the nation-building efforts in Sub-Saharan Africa and Central Asia; and (3) Disaster Relief, such as the humanitarian actions following Hurricane Katrina and the South Pacific Tsunami.

Although the R&VI industry is robust and prosperous, and competition among service and sector providers in the industry is high and increasing, there are significant challenges and risks that require sound strategic planning and leadership to set the conditions for success – for clients, customers, and the providers themselves.

This paper captures a comprehensive five-month study of the reconstruction and vital infrastructure industry. It seeks to define the industry, current conditions, and trends. It explores challenges and risks, especially those associated with the transformation of the U.S. Government. The paper provides several recommendations to overcome challenges and shape a positive future, and four essays provide deeper analysis of relevant topics.

SEMINAR MEMBERS

Col Anthony R. Baity, U.S. Air Force Reserve

Mr. Robert Coffman, Dept of the Navy

LTC Debra D. Daniels, U.S. Army

LTC William Davisson, U.S. Army

Ms. Carmen Eldridge, Missile Defense Agency

COL Aarne Ermus, Estonian Defense Forces

Mr. James F. Ferguson, U.S. Coast Guard

Ms. Gail Forest, Dept of the Air Force

COL Patrick J. O'Connor, U.S. Marine Corps

CAPT David J. Randle, U.S. Navy

LTC Michael Rogers, U.S. Army

LTC Scott Schutzmeister, U.S. Army

Mr. James O. Smaugh, Jr., National Geospatial-Intelligence Agency

CDR Elizabeth M. Steele, Canadian Forces

Lt Col Calvin Williams, U.S. Air Force

Mr. Gregory Wojtkun, National Geospatial-Intelligence Agency

FACULTY MEMBERS

CAPT Kenneth C. Ryan, U.S. Navy, Faculty
Dr. Andrew Leith, Faculty

PLACES VISITED & GUESTS

Domestic:

Blackwater USA, Moyock, NC
Provisional Reconstruction Team (PRT) Training, Fort Bragg, NC
The Louis Berger Group, Washington, DC
CH2MHill, Washington, DC
CSIS, Washington, DC
Enterria Solutions, LLC, Washington, DC
U.S. Army Corps of Engineers, New Orleans, LA
The World Bank, Washington, DC
The International Monetary Fund, Washington, DC
Lockheed-Martin PAE Group, Los Angeles, CA
Parsons Corporation, Pasadena, CA
The Prince Group LLC, Washington DC
New York City Office of Emergency Management, New York, NY
Office of Coordinator for Reconstruction and Stabilization, U.S. State Department
United Nations Department of Peacekeeping Operations, New York, NY
United States Institute of Peace, Washington, DC
U.S. Army Peacekeeping and Stability Operations Institute, Carlisle, PA
Washington Group International, Washington, DC

International:

Lesotho Highlands Water Project Office, Maseru, Lesotho
African Renaissance Project, University of South Africa, Pretoria, South Africa
Group Five, Sandton, South Africa
Grinaker, Morningside, South Africa
USAID, Maputo, Mozambique
US State Department, Maputo, Mozambique
World Bank, Maputo, Mozambique
Electronic Supply Commission (ESKOM), Sandton, South Africa
Aveng Group, Sandton, South Africa

INTRODUCTION

The Reconstruction and Vital Infrastructure (R&VI) industry is multidimensional and complex with myriad markets and sub-markets. The industry is an amalgamation of various industries, which include agriculture, food, water, public health, emergency services, government, telecommunications, energy, transportation, banking, and finance.

Reconstruction occurs in pre-conflict, post-conflict, and post-disaster operational environments. These environments pose significantly different risks and rewards will ultimately determine what firms commit their resources for reconstruction. Pre-conflict and post-conflict reconstruction operations are centered on ensuring long-lasting peace and stability in other nations through effective rebuilding of vital infrastructure and socioeconomic institutions that make a civil society possible. If the global community can reduce the number of failed states or assist states in the pre or post conflict phase, then security risks from unstable political entities will decline.

Clearly, the industry has grown in importance to United States policy-makers in the “post-9/11” world. The most recent National Security Strategy, published in 2006, reiterates the U.S. commitment to development. Economic development requires both a politically stable and functioning government with a social structure that allows for the progression of human development. Fostering the development of an economic infrastructure requires a government that is both protective, as well as productive, enabling the advance of social systems that allow personal productivity. When government does not provide both of these functions, the result can be a failed and failing state.

This paper captures a comprehensive five-month study of the reconstruction and vital infrastructure industry. It seeks to define the industry, current conditions, and trends. It explores challenges and risks, especially those associated with the transformation of the U.S. Government (USG). The paper provides several recommendations to overcome challenges and shape a positive future, and four essays to provide deeper analysis of relevant topics.

THE INDUSTRY DEFINED

The R&VI industry provides the crucial services needed to foster “security, governance and participation, social and economic well-being, and justice and reconciliation” within a nation-state or region (Orr, 2004, p. 10). These are the pillars of reconstruction and stabilization. This industry serves as an enabler for the government and its people. It is normally employed in response to the threats and challenges associated with conflict (wars, post-hostilities), environmental destruction (hurricanes, tsunamis, floods), public health (pandemics—*influenza* and AIDS/HIV), and illicit trafficking (weapons, drugs, human beings) (USG, 2006, p. 9).

The National Security Strategy (NSS) of the United States of America declares that “...even if the United States does not have a direct stake in a particular conflict, [or environmental, public health or illicit trade issue, its]...interests are likely to be affected over time” (USG, 2006, p. 14). The United States strategy is to create a condition under which... [countries or regions] themselves can effectively deal with these threats and challenges—

conflict, environmental destruction, public health and illicit trade—before they can directly impact the global community. The nation’s R&VI industry contributes to multi-lateral efforts against these threats and challenges.

The R&VI industry is primarily engineering and construction services firms that compete for aid-sponsored reconstruction contracts, e.g. rebuilding roads, reconnecting power and water supplies, and managing projects. R&VI companies, especially large and global firms, will seize opportunities in post-conflict countries and disaster relief regions, if the projects are commensurate with their size and capabilities.

The industry “respond[s] to immediate needs, establish [es] foundation[s] for development and institutionalize[s] long-term development program[s]” (Bray, 2005, p. VI-1). The U.S. government’s success in addressing these threats and challenges clearly depends on its federal agencies, which represent the nation’s instruments of power—diplomacy, information, military, economic, finance, intelligence, and law enforcement.

CURRENT STATE OF THE INDUSTRY

The R&VI industry is robust and prosperous with intense competition among service providers. Competition generated by participants allows new entrants, and takes pride in established linkages and relationships with client organizations (e.g., public and private sector government and military) and reputations for performance in providing quality service. The industry has spawned specialized expertise in such niche markets as services, security, architectural and engineering services, as well as planning and program management (consultants).

Global revenues are hard to quantify fully, as numerous companies participating in reconstruction efforts report earnings under several Department of Commerce North American Industry Classification System (NAICS) codes. NAICS groups establishments into industries based on the activities in which they are primarily engaged, e.g., engineering services (NAICS code 54133 – captures most R&VI efforts). R&VI service contracting requirements have steadily increased post 9/11, resulting from military and other government operations supporting the Global War on Terrorism (GWOT). Service contracts supporting reconstruction and stability operations in Iraq and Afghanistan, as well as disaster relief, continue to consume an increasing share of the U.S. Government budget.

As of July 2004, 151 “post-war” companies were ranked according to contract values received from Iraq and Afghanistan contracts over a two-year period that generated combined revenue of almost \$52 billion. This is a six-fold increase over the period covering 2002-2003, in which only 72 “post-war” companies were ranked according to contracts received in Iraq and Afghanistan and generated combined revenue of over \$8 billion. Indications are that as reconstruction and stability operations increase, so do the number of service contracts. Again, capturing and quantifying all reconstruction activities is difficult because larger, well-established, domestically-based construction companies specialize in numerous market sectors and maintain several NAICS codes. Appendix A provides a sample of companies participating in

post-conflict and post disaster reconstruction efforts. Appendix B provides a list of USAID partners that support multiple facets of development and recovery projects.

The leading construction firms in the R&VI industry have developed relationships with domestic and international partners who provide access to technology, financial resources, international markets, and communities to increase capability and capacity. This trend allows contractors to spread risks and contract costs across a broad spectrum and to share labor pools and resources. To expand capability, construction firms have begun to acquire firms and leverage their strengths to increase share in new markets. By way of example, Lockheed Martin's acquisition of PAE leverages PAE's architecture and engineering capability and enhances Lockheed Martin's reputation for successful R&VI efforts in various high-risk Pacific Rim countries.

Other leading construction firms such as Fluor, Washington Group, Halliburton, CH2MHill, and Louis Berger are major forces in the growth of R&VI. These firms rank near the top as post-war contractors by total contract value in Iraq and Afghanistan from 2002 through July 1, 2004. The top four firms, Halliburton, Parsons Corporation, Fluor Corporation, and Washington Group International received a combined total of over \$23 billion in reconstruction contracts. CH2MHill and Louis Berger are listed as numbers 11 and 21 respectively, with a combined \$2 billion in contracts.

In contrast to the domestic market, large South African companies such as Group Five and Aveng (and subsidiary Grinaker) take a more strategic and holistic approach to R&VI. Across the southern Africa region, there is awareness and acceptance of cultural diversity. R&VI in Africa is burdened by environmental disaster, continual conflict and pandemics--such as malaria, influenza, and AIDS/HIV rates that have diminished the employable population as quickly as they can be trained. Conflict has rendered borders transparent and citizens migratory causing countries to become their "neighbor's keeper." Both companies balance financial responsibility with human capital development due to an increasing awareness that improvement within the region is instrumental to the successful rebuilding of the southern Africa Diaspora.

Group Five's successful operation in countries such as the Democratic Republic of the Congo, Zimbabwe, and Angola is based on their willingness to work in conflict areas. Their R&VI efforts are coupled with a strategic vision; they leave a lasting benefit to the country and its people –growth beyond the physical structure. Both Grinaker and Group Five realize that their continued existence depends on the people, the planet, and partnerships: the development of the people, protection of the environment and working in partnership with the government.

Currently, there are several enablers in the reconstruction success. Organizations such as the United Nations, USAID, World Bank, International Monetary Fund, and Millennium Challenge Corporation assist reconstruction efforts by providing financial support, through grants and loans, to participating governments, nongovernmental organizations (NGOs) and other relief agencies. With financial support comes assistance to mitigate the social and economic issues of the country. In Mozambique, the government and NGOs welcome the World Bank's presence. The bank has a long-term perspective that balances the prevention and

treatment of social issues and provides expertise in implementation, while providing transparency and accountability.

CURRENT OPERATIONAL ENVIRONMENT

R&VI occurs in pre-conflict, post-conflict, and post-disaster operational environments. These environments pose significantly different risks and rewards that will ultimately determine what industry firms commit their resources. Pre-conflict and post-conflict reconstruction operations are centered on ensuring long-lasting peace and stability in other nations through effective rebuilding of vital infrastructure and socioeconomic institutions that make a civil society possible.

Firms are generally attracted to the pre-conflict and post-conflict operational environments. Their motivation comes from profit, guaranteed financing from international aid, and the potential for long-term business within a stable society. However, many large international firms do not compete in the pre-conflict and post-conflict environment due to inexperience, security and political risks, and corrupt government officials. This has been especially evident in Iraq where only eight of the largest international contractors are working.

Regional companies and niche players with a high tolerance for risk fill any void left by large international reconstruction firms. In regards to the post-conflict environment, the market structure of firms that operate in this environment is generally based on the time frame and the scope of the projects. The immediate post-conflict reconstruction phase typically resembles a market structure characterized as an oligopoly due to the small number of large international firms performing large-scale projects with guaranteed payments from international aid organizations.

In the mid to long-term following the cessation of conflict, these markets resemble more of a competitive price-searcher market, based on the large number of local and regional contractors performing smaller scale projects funded with less international aid and more private investment and local government funding. Reconstruction in the post-disaster operational environment refers to those operations inside or outside the United States.

The U.S. post-disaster operational environment normally has less risk and more rewards for R&VI firms as compared to the pre-conflict and post-conflict operational environments. As a result, a significant number of firms compete. However, there are challenges in this environment that includes public and private collaboration. The private sector brings significant advantages to the post-disaster environment that have yet to be fully exploited by federal, state, and local governments. The most effective tool for successful post-disaster reconstruction operations is a strong public and private partnership before the disaster.

The ability to surge for R&VI operations is more robust in the U.S. post-disaster operational environment than the pre-conflict and post-conflict operational environments based on the difference in risks and rewards as discussed. Reconstruction refers to the rebuilding of vital infrastructure and the socioeconomic institutions that make a civil society possible. An

increase in public will for reconstruction leads to an increase in public funding for reconstruction.

CHALLENGES & RISKS

The R&VI industry faces numerous challenges and risks that require sound strategic planning and leadership. These include significant collaboration with the U.S. Government, international donor agencies, and beneficiaries.

The U.S. Government, international agencies, and private donors provide both requirements and resources to the R&VI industry; therefore, sustaining an adequate structure and strategy is critical to industry success. Interagency and international collaboration for which the United States is not adequately structured presents a significant challenge to the R&VI industry. As the clients of reconstruction solidify their structure, there remains the fundamental question: how can limited financial resources be spent most effectively? When the clients are not consistent on their vision and strategies of reconstruction, there is a corresponding risk of consistent financial resources for the R&VI industry. There is normally little risk of not being paid when reconstruction projects are financed directly by bilateral aid or by multilateral institutions. However, many donors favor a strategy that funnels aid through the local governments to build their governance capabilities, and this method poses an increased risk of companies not being paid.

Reconstruction in both post-conflict environments and conflict prevention settings will be associated with significant political and security risks. The extent to which companies are prepared to take these risks depends on their individual strategies and above all, their assessment of commercial opportunities (Bray, 2005, p.2). Private investors are reluctant to pursue projects in regions of instability and defer long-term commitments until there is a stable and relatively predictable political environment. Construction and engineering firms deal with corruption in all facets of their operations; however, the risks are especially greater in post-conflict economies where political and judicial systems are poorly established.

The R&VI industry, especially the large and global firms, will seize opportunities if the projects are commensurate with their size and capabilities; however, the most significant risks stem from the shortage of skilled labor. In countries ravaged by civil war or oppressed by dictatorial regimes, the majority of the workforce is often uneducated or poorly trained in critical fields. To compound the challenges of building a capable workforce is the global pandemic of HIV/AIDS, which is devastating entire generations of potential workers in under-developed regions of the world.

OUTLOOK: LAYING THE FOUNDATION FOR FUTURE INQUIRY

The demand for R&VI varies considerably by incident. The response to disruptions in one region is often very different from those needed for a disruption in another region.

The 21st century will see increased demands placed on the R&VI industry. The demographic outlook predicts that the population of the world will increase to roughly

9.22 billion by 2075 before beginning to decline (UN, 2006, Executive Summary). The most marked security phenomenon since the end of the Cold War has been the proliferation of armed conflict within states. The United Nations International Committee on Intervention and State Sovereignty predicts that the number of intra-state conflicts and natural disasters experienced in the 1990's in recent years will increase into the future (UN, ICISS, p. 9).

In the short-term of one to five years, the outlook for the industry is promising; with smaller and medium size companies merging. Certain impediments might prevent the R&VI industry from achieving its full surge and mobilization potential. These include:

- Volatile raw material supplies
- Existing infrastructure - availability of reliable power, water, public health, transportation and communication systems
- Shortage of skilled workforce, despite there being a large proportion of the population of working age
- Labor laws that are not transparent, supportive of industry requirements and reflective of international human rights standards
- Limited education of the population
- Inadequate government legislation to foster business start-up
- Lack of ‘tertiary beneficiation’ - a country or region’s ability to expand the market to manufactured goods, not just extract raw materials and resources from the territory and export elsewhere for further treatment
- Time required to direct donor funds to R&VI industry projects (pay the bills)

In the 2008-2025 timeframe, a more significant factor will be the sustainability of R&VI capital investments. In Iraq, many of the capital reconstruction projects are in serious risk of complete failure because long-term maintenance and upkeep was not factored into the initial project design and cost (see Essay #4). There is a requirement to build locally sustainable solutions that will endure beyond the initial implementation phase of R&VI projects and efforts.

Additional political and social factors impacting the industry's short- and long-term outlook:

- Corruption in governance
- Corporate social responsibility - “Most large international companies now emphasize corporate social responsibility including charitable programs. However, companies’ most significant impact will come from the way they conduct their core activities and in particular their relationships with local communities and sub-contractors. Greater awareness of the risk of ‘doing harm’ has increased interest in the concept of conflict impact assessment as a sub-category of social impact assessment...NGOs are now developing tools to assist with this process” (Bray, 2005, p. 9).

GOVERNMENT ROLES AND GOALS

The U.S. Government has the following specific roles with respect to this industry.

- Mentor – market economy serves as role model; diplomatic presence is worldwide
- Regulator – standards for safety are well established
- Consumer – national spending priorities play a large role in sustaining or expanding the industry
- Protector – keeps vital infrastructure safe at home and facilitates safety of contractors working in international “hot spots”
- Financier - includes direct purchases of goods and services in the United States, and indirect purchases on the behalf of foreign governments through USAID, et al.
- Integrator - coordinates efforts of armed forces and federal agencies; solicits and brings together resources from partners (e.g. NATO partners)
- Provider - includes services such as military security for stabilization, planning and supervision for reconstruction

National Security Presidential Directive 44 (NSPD-44) states the United States has a significant stake in enhancing the capacity to assist in stabilizing and reconstructing countries or regions, especially those at risk of, in, or in transition from conflict or civil strife, and to help them establish a sustainable path toward peaceful societies, democracies, and market economies. The United States should work with other countries and organizations to anticipate state failure, avoid it whenever possible, and respond quickly and effectively when necessary and appropriate to promote peace, security, development, democratic practices, market economies, and the rule of law. Such work should aim to enable governments abroad to exercise sovereignty over their own territories and to prevent those territories from being used as a base of operations or safe haven for extremists, terrorists, organized crime groups, or others who pose a threat to U.S. foreign policy, security, or economic interests.

With respect to R&VI, the primary goal of the U.S. Government is to provide a “damaged” or “at risk” region with a framework to create economic capacity. Department of Defense (DOD) Directive 3000.05 (dated November 28, 2005) provides guidance on *Military Support for Stability, Security, Transition, and Reconstruction (SSTR) Operations*. Two key aspects of this directive is the policy that “stability operations are a core U.S. military mission...that shall be given priority comparable to combat operations...” However, the 2006 U.S. National Security Strategy states military involvement is necessary to stop a bloody conflict, but peace and stability will last only if follow-on efforts to restore order and rebuild are successful. As such, the State Department’s Office of the Coordinator for Reconstruction and Stabilization (S/CRS) is charged with integrating all relevant U.S. resources and assets to conduct reconstruction and stabilization operations, and coordinating these operations with the Defense Department to ensure synchronization with any military operations (USG, 2006, p. 9).

The S/CRS’ mission is to, “Lead, coordinate, and institutionalize U.S. Government civilian capacity to prevent or prepare for post-conflict situations, and to help stabilize and reconstruct societies in transition from conflict or civil strife so they can reach a sustainable path towards peace, democracy, and a market economy” (DOS, 2007, homepage). Therefore, the

success of reconstruction will depend on S/CRS' ability to plan and develop an integrated approach to deal with the interdependent civilian and military responsibilities on the ground (USG, 2005, p. 4).

Furthermore, military-civilian teams are deemed a critical U.S. Government stability operations tool, and DoD shall continue to lead and support the development of military-civilian teams (DoD, 2005, pgs. 1-3). The most recent examples are the Provincial Reconstruction Teams (see Essay #3) deployed in both Iraq and Afghanistan to "develop a transparent and sustained capability to govern, promoting increased security and rule of law, promoting political and economic development and providing administration necessary to meet the basic needs of the population (USG, 2007, p. 124).

Economic development requires both a politically stable and functioning government with a social structure that allows for the progression of human development. To foster the development of an economic infrastructure requires a government that is both protective, as well as productive, enabling the development of social systems that allow personal productivity. This is the economic responsibility of the government.

CONCLUSION AND RECOMMENDATIONS

The concept of R&VI is well known (e.g. the Marshall Plan, Civil Operations and Revolutionary Development Support). It is both complex and multidimensional, taking on many forms and faces over the years, from niche providers to service providers. The one thing is that the multi-dimensional characteristics of its service providers will enable this industry to endure. Those characteristics make this industry adaptable and flexible, which perfectly fits the volatile, unpredictable environment in which it operates. With this said, we present the following conclusions and recommendations:

Conclusions:

- The domestic and global benefits of R&VI outweigh the challenges and risks. Reconstruction and economic development are often better investments of national resources than military action.
- The R&VI industry significantly contributes to today's national security environment and its industrial base. The industry supports implementation of our nation's National Security Strategy, promotes domestic and global partnerships, and is in our national interest.
- R&VI is a growing industry that will endure because it is multi-dimensional, adaptable, and flexible to evolving requirements. The larger companies can survive as requirements flux because of surge capacity and niche capability. Additionally, it will take decades to complete reconstruction requirements in developing countries.

Recommendations:

The U.S. Government must

- Establish realistic performance metrics relevant to local reconstruction efforts to determine success.
- Improve interagency collaboration and coordination.
- Develop a process to leverage the best-in-business practices to address the complex planning and execution of reconstruction tasks better.
- Reduce congressional earmarks that attempt to conduct foreign policy through appropriations.
- Understand the culture of developing societies and investigate improvements in the integration of behavioral science and the human element into policy implementation.
- Make a concerted effort at strategic communications to improve America's image around the world, whether through a reconstituted United States Information Agency, the Voice of America, or other organizations.

ESSAY # 1:

The Reconstruction Industry: An Evaluation of the Disaster Relief Market

The Reconstruction Industry has never been more visible than in the last decade, especially in the area of Disaster Relief. Within the government, the National Response Plan recognizes the private sector as a key partner in domestic incident management, particularly in the area of critical infrastructure protection and restoration. Private sector entities are also called upon to contribute necessary items and services to the impacted area (DHS, 2006, p. 3). In this important yet complex market, a close evaluation of Disaster Relief provides an interesting view of the behaviors and motivations of firms, the structure and performance of the market, and government policy towards the Reconstruction Industry. This essay will describe the Disaster Relief market; explain how firms in this market compete and perform, and recommend public policy toward this market and industry.

Background

The Disaster Relief market can also be viewed in three sectors: (1) Response, primarily search & rescue operations and emergency management; (2) Relief, primarily infrastructure repair & restoration, engineering services, and transportation support; and (3) Recovery, primarily health & human services, public safety & security, and long-term economic and community assistance. These sectors of Disaster Relief are fully described in the National Response Plan, which established Emergency Support Functions as an effective mechanism to group capabilities and resources into functions that are most likely needed during actual or potential incidents where coordinated Federal response is required (DHS, 2006, p. 14).

Discussion

In the aftermath of natural disasters, there is a demand for services to repair and restore infrastructure, as well as the immediate transportation of vital supplies to and from the disaster-affected areas. The private sector supplies engineering services, construction management, and transportation support in response to these demands. Given the MIT Dictionary of Modern Economics defines “market”, as “generally, any context in which the sale and purchase of goods and service takes place...and for which there need be no (corresponding) physical entity...” then disaster relief does in fact constitute a “market” (Berg, 2002, p. 33).

Generally, the Disaster Relief market structure portrays a nearly perfect competition market. Given the four generally accepted characteristics of perfect competition: (1) the product is homogenous; (2) all buyers and sellers have all relevant information; (3) no buyer or seller is big or large enough to affect significantly the market price or other market conditions; (4) entry and exit from the market are unencumbered; the Disaster Relief market has relatively few “flaws” (Berg, p. 45).

Disaster Relief Firms

Over the past decade, there has been an increase in the demand for the capabilities and services within the Reconstruction Industry, and particularly the Disaster Relief market. The most recent devastating disasters have actually increased competition among the private sector;

therefore requiring firms to develop sound strategies and adapt to both rapidly changing technologies and bureaucratic processes.

Several large firms seek a competitive advantage by demonstrating the capability to integrate and manage complex and multi-discipline operations. In terms of strategic planning, these firms may seek mergers or acquisitions with firms that possess unique expertise. Likewise, some firms may seek a strategy focused on sub-contracting expertise to expand their capabilities. Additionally, firms are adapting to a recent trend of “mission decomposition,” where the majority of tasks are competed individually to maximize the number of firms awarded contracts. This approach may not be the most efficient, but is strongly supported by local officials and politicians. The impact on Disaster Relief firms is the need to be flexible and agile in terms of contractor performance, from bidding to execution, as well as the ability to “weather” the slow and cumbersome governmental processes for payment and oversight that have become the norm.

Disaster Relief Performance

Regardless of the harsh criticism of Hurricane Katrina disaster relief, the market performs well in serving the public interest. At the foundation of disaster relief, specifically the markets that support the Emergency Support Functions of Transportation and Public Works & Engineering, performance has had a direct impact on saving lives under extraordinary circumstances. The Disaster Relief firms have continually demonstrated the ability to react, respond, and execute critical tasks. This is not to say that profiteering is non-existent; however, the Reconstruction and Disaster Relief industries have adequately partnered with government agencies to improve both their shortfalls and enhance their capabilities.

Recommendations

There are several areas to address concerning public policy toward Reconstruction and Disaster Relief to improve the planning, execution, and capabilities of all interested parties. The Disaster Relief firms would be better served by becoming “more local.” This approach not only supports the political will during relief operations, but also sets the conditions for success for the long-term recovery when local entities need to leverage the “name-brand” of the larger firms (Dearing, 2006, p. 9). It would also provide a degree of redundancy that is valuable until a region could begin to help itself. Given the necessary partnerships of government and private sector, there is a need for a more comprehensive framework that would leverage the comparative advantages of all responders/players in the Disaster Relief market. This would allow all entities to understand better the military’s effective command and control capabilities; the private sector’s established distribution networks and technical expertise; as well as the government and non-governmental organization’s long-standing relationships with specific regions across the globe.

Author: LTC Scott Schutzmeister

ESSAY # 2:**Water and Sewage as Vital Infrastructure**

Water is vital for human survival, yet clean water is beyond the reach of 1.1 billion people on this planet, mostly in developing nations (Solar, 2007). An estimated 2.2 million die each year of diarrhea (Tumwine, 2005), while the global disease burden from water and sanitation-related diseases exceeds 82 million disability-adjusted life years (Montgomery and Elimelech, 2007). Large-scale water projects work well in urban areas, where there are a large number of customers in a relatively small area.

However, in rural areas, dispersed populations drive the per-capita cost of delivering water much higher. Solutions for clean water here involve either wells to draw out groundwater (from aquifers), or water purification at the point of use. While many have tried, to date no business model has demonstrated an ability to make a profit in providing clean water to rural villages in developing nations. This dilemma (water is vital for life, but people cannot afford it) is similar to that faced by the producers of the fictional *Hitchhiker's Guide to the Galaxy*: "Pick a segment of the market that, almost by definition, has no money, and try to sell to them" (Adams, 1992, p. 70). This impasse leaves the market in a not-for-profit model.

Boiling water is effective in killing most waterborne diseases. However, boiling takes a lot of energy, and it is often impractical in areas with little wood or other fuel (Tumwine, 2005). Here are some of the other technological options available:

- Lifestraw, manufactured by the Danish firm Vestergaard-Frandsen, is a tube with seven graduated mesh filters, followed by resin, iodine, and carbon. It filters out 99.99% of bacteria and parasites, enabling the consumer to put Lifestraw into polluted water and drink clean water. It lasts a year and costs \$3 (McNeil, 2006).
- Chlorine tablets such as Procter & Gamble's Pur brand and Waterhealth International's purification system disinfect water, but often leave an unpleasant taste. Firms now use this as a marketing tool, identifying chlorine as the "taste of safety" and convincing families to refuse to drink water without that flavor (Harder, 2003).
- Sunlight is effective at purifying water. This can be a locally produced device made from cardboard, aluminum foil, and a handmade thermometer made of wax (Thacker, 2004), or the commercial easy-to-use polyethylene bag called Aqua Pak made by Solar Solutions.
- Playpumps combine a 2500-liter aboveground cistern with a well and a merry-go-round operated pump. Each revolution puts 3 liters of water into the cistern, and the pump is powered by an inexhaustible energy source - children. Retail cost is \$14,000 (Playpumps, 2007).
- Nanotechnology is not yet in the market, but Argonid Nanomaterials is making nano-filtration products able to sort sub-micron and nano-size particles (Nanotechnology, 2007).

The portion of the world's population without access to clean water is declining, but only slowly, from 23% in 1990 to 17% in 2002 (The Economist, 2004). The United States has a strategic opportunity here to demonstrate benevolent "soft power," and an economic interest in helping poor nations develop. Here are two examples of how clean water serves the public interest: 1) Providing clean drinking water directly reduces health care costs and puts people back to work. India lost 73 million workdays in the 1980s from water-related illnesses, costing that nation \$600M (Loranger, 2005). 2) It is not just the quality of water that is important, but also the quantity (Brown, 2004). Accessibility to water enables families to use water for hygiene, and for growing and washing vegetables (Montgomery and Menachem, 2007).

Sewage

As with any produced resource, waste products are formed. Water usage produces sewage and sewage must be treated properly. In its most common usage, sewage refers to municipal wastewater that contains a broad spectrum of contaminants resulting from the mixing of wastewaters from different sources. Even before Operation Iraqi Freedom (OIF), dilapidated water-treatment plants in Iraq shunted hundreds of millions of gallons of raw sewage into the Tigris and Euphrates Rivers daily. The potential public health and safety consequences demanded a rapid response. Since the initial conflict, hundreds of millions of dollars have been spent on repairs.

Sewage collection, treatment, and disposal are a utility. As such, it falls under North American Industrial Classification System (NAICS) sector 22. Construction of sewage treatment plants or facilities comes under NAICS sector 23. *Sewerage* is the system of sewers that conveys wastewater to a treatment plant or disposal point. The term *sewerage* also includes all pumps, rising mains, gravity mains, air release valves, screens, overflows and infrastructure.

The U.S. Agency for International Development (USAID) is funding a project to improve the reliability of wastewater facilities in Iraq. The prime contractor is Bechtel. As a subcontractor, Parsons is tracking more than 70 rural water projects and providing system operations and maintenance capabilities for the future (Parsons, 2007, p. 46). The relationship between Bechtel and Parsons underscores the interdependence of the firms in this market.

When it comes to reconstruction of this vital infrastructure, the normal process is for the United Nations (UN) or U.S. Government (USG) to coordinate the project. However, operation and maintenance of sewage treatment and disposal facilities is transferred to local government as soon as possible following restoration.

We believe that collecting, treating and disposing of sewage are vital infrastructure. Sewage treatment is properly operated as a public utility, which seeks to serve the public interest. There are about 16,000 publicly owned wastewater treatment facilities in the United States (Copeland, 2005, p. 2).

While wastewater treatment is a public utility that serves the public interest by promoting public health, it is not a *public good*. For a service to be a public good, it has to be impossible (or

at least very costly) to exclude nonpaying customers from receiving the service (Gwartney, 2002, p. 116). Such is not the case with sewage treatment. Nonpaying customers risk having their water turned off. Revenues are essential to improving sewerage and sewage treatment facilities.

Public policy regarding this vital infrastructure should be expanded to focus on physical security. “There are no federal standards or agreed-upon industry best practices with the water infrastructure sector to govern readiness, response to security incidents, and recovery” (Copeland, 2005, p. i). The vulnerabilities of this vital infrastructure are not new; the terrorist attacks on 11 September 2001 served only to underscore them.

Authors: Col Anthony Baity, CAPT David Randle, and Mr. James Ferguson



J C A F

ESSAY # 3:

The Role of Provincial Reconstruction Teams in R&VI

In the new millennium, reconstruction or nation building focused on Afghanistan and Iraq. Not since WWII has the United States launched such a grand endeavor. These two countries bring significant challenges that did not plague Germany following WWII (e.g. relentless insurgents and an economy that had been neglected for years). To overcome so many obstacles, the United States began dispatching Provincial Reconstruction Teams (PRT) about five years ago. What is the role of PRTs in current nation building, and what should be our future PRT strategy?

Originally called Joint Regional Teams, PRT is the term that Afghan President Karzai coined. He wanted to emphasize the importance of reconstruction for these teams. “‘Warlords rule regions; governors rule provinces’, he said” (McNerney, 2006, p. 36). PRTs are small, joint civilian-military organizations. The earliest PRTs were rooted in the International Security Assistance Force (ISAF). These international organizations are led by foreign powers; recently Japan, Germany, and the United Kingdom have each led a PRT. Members of the North Atlantic Treaty Organization (NATO) have seized opportunities to support and lead ISAF PRTs. Their objectives emphasize flexibility, promote national models, and reflect an ad-hoc approach to security and development (Perito, 2005, p. 1).

The creation of American-led PRTs was meant to leverage successes achieved by ISAF PRTs that were fully burdened and operating at capacity. U.S.-led PRTs feature governance and force protection. Their emphasis on the reconstruction mission distinguishes them from ISAF-led PRTs. They seek to win hearts and minds through immediate-impact development projects.

The first American-led PRT was deployed to Gardez, Afghanistan. The size of the PRTs varied in the beginning, but a typical complement now includes about eighty American military and three civilian government employees. The civilians usually represent Department of Agriculture, Department of Justice, Department of State, or the U.S. Agency for International Development (USAID).

Originally, the military members of American-led PRTs were virtually all Army (including Army National Guard). However, an increasing number of Navy and Air Force (including Air National Guard) personnel voluntarily augment PRTs. The few women assigned to PRTs are usually medics or corpsmen. Afghan and Iraqi cultural norms preclude having more female members attached. Of course, there is also a certain irony to this discrepancy. As easy targets of hostility, women suffer more during conflicts. Moreover, it is largely the native women who bear the burden of reconstruction. As survivors of violence, they go back to destroyed communities to rebuild and repair them (Conaway, 2006, p. 3).

Strategically, PRTs seek to develop capacity and self-reliance for the host countries. NATO-led, UN-mandated, ISAF PRTs and U.S.-led, host-country invited, coalition PRTs have slightly different agendas at the tactical level. This dichotomy in mandates has created tension between the two operations in Afghanistan. USG would prefer to combine OEF and ISAF – but

only if two critical missions are preserved - annihilate Al Qaeda and Taliban forces, and help the Afghanistan government eradicate opium. Persuading other Alliance governments to accept a direct combat role for ISAF has been difficult, so progress towards a consolidated NATO command is slow. Personnel from more than a dozen countries participate in 22 PRTs in Afghanistan. Nonetheless, a majority of these teams are led by U.S. commanders (the ratio is 2:1).

Underpinning the concept of PRTs is the Defense Science Board's 2004 Summer Study on Transition to and from Hostilities. Its vision of enhancing U.S. effectiveness across the spectrum of activities from peacetime through stabilization and reconstruction includes two dimensions (DoD, 2004, p. 1). The first step is to extend the scope of the federal government to include stabilization and reconstruction. Before launching OEF in 2001, the USG relied exclusively on its military for nation building.

It has become quite apparent that the participation of civilian agencies (e.g. USAID) is key to achieving long-term U.S. objectives in nation building. While this change is a paradigm-shift for the USG, it is integral to the structure of PRTs. This transformation is a work in progress and suffers from some of the same troubles as the Inter-Agency in general. Problems specific to PRTs stem from roles and missions. Military personnel have complained that the civilian representatives were inexperienced and brought no resources. Civilians have complained that the military were reluctant to support them and treated them as outsiders (McNerney, 2006, p. 37).

The Special Inspector General for Iraq Reconstruction, Stuart Bowen, recently urged Congress to pursue reforms to better delineate authority and procedures. Bowen cited the State Department's Office of the Coordinator for Reconstruction and Stabilization as the proper leader on interagency efforts. He also advocated formation of a civilian reserve corps – an idea that President Bush advanced in his 2007 State of the Union address.

The second step supporting the Defense Science Board's vision is to build and maintain vital capabilities that are essential for executing stabilization and reconstruction (S&R). These abilities include S&R skills; strategic communication; knowledge and intelligence for the 21st century; and identification, location, and tracking for asymmetric warfare (DoD, 2004, p. 1). These capabilities are generally lacking in the U.S. military. A pessimist would consider this situation to be a weakness, but an optimist would see it as an opportunity.

The Defense Science Board followed its 2004 Report on Transition to and from Hostilities with its Report of the Defense Science Board Task Force on Institutionalizing Stability Operations within DoD in September 2005. These two reports led to the Pentagon issuing the Directive on Military Support for Stability, Security, Transition, and Reconstruction (DoD, 2005). It promulgated new policy regarding stability operations and related post-conflict operations. By elevating stability missions to the same priority level as combat, DoD seems to be acknowledging that future operations will often include S&R phases (Serafino, 2007, p. 11). DoD Directive 3000.05 could be the catalyst for another military revolution that will focus on how to fill the performance gap in S&R operations.

“Since the end of the Cold War, the pace of U.S. military interventions has risen to about one every two years, while the frequency of new UN peacekeeping missions is up to nearly one every six months” (Dobbins et. al., 2007, p. xvii). It is difficult to conceive of a U.S. - led combat operation that would not require a reconstruction phase (i.e. phase IV). Nation building is a logical approach to managing consequences of military operations to win the peace.

Each PRT must remain cognizant of where its responsibilities end and where transfer of authority to host-country government begins. “It is not the job of the intervening authorities to provide levels of service common to developed countries, but rather to restart the provision of power and water and to support the system so that supplies are provided at sustained pre-conflict levels” (Dobbins et. al., 2007, p. 145). While restoring public utilities is costly, keeping the lights and water on can be even more expensive. To ensure adequate cash flow, the government must re-establish payment systems for these utilities. Once restored, service must be maintained because interruptions can lose more hearts and minds than not restoring service at all.

Of course, the primary mission for U.S.-led PRTs is security (force-protection and rule of law). This function is where the U.S. military has always excelled. However, NATO nations are reluctant for their PRTs to accept this responsibility. The result is that those PRTs are deployed to more permissive provinces, and U.S.-led PRTs are deployed to less permissive provinces.

Whether deployed to Afghanistan or Iraq, led by either NATO or the United States, Provincial Reconstruction Teams are imperfect. While the model has room for improvement, it should be enhanced and expanded – not abandoned. As explained above, standardization would increase its efficiency. Another area for improvement would be to establish measures of effectiveness to facilitate evaluation of their core missions and establish feedback cycles for process review.

Reconstruction and nation building is a growing industry. PRTs can be the catalyst for successes in current and future operations. Both the industry and the model are maturing, but progress through their respective life cycles will be measured over decades or generations – not months or years. The PRT model has deficiencies and will never be all things to all people. Nevertheless, it will always have a key role in nation building.

In a mature state, PRTs will complement the efforts of NGOs by synergistically leveraging relevant competencies of all branches of the U.S. armed forces, the militaries of all NATO members, and all departments and agencies of the USG. Only by constantly reevaluating the performance of PRTs, can USG goal hope to improve the model. Although perfection sometimes gets in the way of “good enough,” perfecting its processes should be as vital for PRTs as creating economic capacity.

Author: Mr. James Ferguson

ESSAY #4

Operations and Maintenance: The Missing Link for Successful Reconstruction and Vital Infrastructure Projects

The ultimate focus of all U.S. policy is the creation and expansion of U.S. national power. The Reconstruction and Vital Infrastructure (R&VI) industry assists in both the domestic and international projection of U.S. national power by providing public and private infrastructure that establishes the foundation for both the economic and military elements of national power. The R&VI industry can be viewed as both a blessing and a travesty. Since the market for the industry stems from disaster, both natural and man-made, one must carefully consider the words of Kennedy and recognize that the ultimate challenge for us in R&VI is to negate the crisis emanating from any form of disaster and search and recognize the opportunities that emerge.

The FY 2008 Office of Management and Budget (OMB) recommendation to Congress listed many significant funding measures relating to R&VI. Of the billions of dollars that are proposed for reconstruction in both Afghanistan and Iraq, the bulk of the funds are earmarked for construction. Little, if any, is specifically earmarked for training local firms and individuals to operate and maintain the facilities once completed. It appears that the United States is living up to the words of Kurt Vonnegut Jr. (American writer, b. 1922), “Another flaw in the human character is that everyone wants to build and nobody wants to do maintenance.”

As we approach our fifth year of involvement in reconstruction and nation building, it is becoming apparent that the capacity of the Iraqi and Afghanistan governmental and private sectors to operate and maintain these facilities is lacking (GAO, 2007). “Why is this?” one might ask. The propensity has been for the United States to not only fund and construct facilities, but it has also provided for a majority of the operations and maintenance after completion of the facility. Some claim that this is because the maintenance culture of the local nationals is not up to the task or that they departed the country and are not available to provide the necessary services. Others claim that the Department of Defense never fully planned for either the contractor support for the maintenance and operation of facilities or the transition of this responsibility to the host country (GAO, 2003).

Facility maintenance and operations should be part of an ongoing long-term management system that plans, guides, and supports total life-cycle management of capital investments and facility management. If those in receipt of the billions of dollars of R&VI support are not bringing the facilities into a state of order, then disorder is just around the corner. According to David M. Walker, Comptroller General of the United States, “As the United States attempts to turn over its reconstruction efforts, the capacity of the Iraqi government to continue overall reconstruction progress is undermined by shortfalls in the capacity of the Iraqi ministries, widespread corruption, and the Iraq government’s ability to fund and execute projects for which funds were previously budgeted” (GAO, 2007).

According to the Deputy Under Secretary of Defense for Installations and Environment, “Facilities sustainment provides the resources for maintenance and repair activities necessary to keep a typical inventory of facilities in good working order over a 50-year service life” (Facilities Sustainment, 2007). As part of the sustainment pillar in the acquisition field, it is

mandated that it be considered as part of any facilities acquisition. It is usually associated with the total Life-Cycle costing approach to facilities acquisition. According to the Commission on Engineering and Technical Systems (CETS), “Despite obstacles to the application of life-cycle cost analysis, government agencies have recognized that the analysis process can yield benefits in efficient utilization of resources... and they have made progress in achieving control of life-cycle cost... this progress has been substantial and offers lessons that are transferable to buildings and other facilities management”. Any facility should be operated and maintained at the same or higher level as for that which it was designed and constructed. This can be achieved through continued use of sustainable design concepts. The role of facility operations is to consistently maintain quality customer experiences without the depletion of resources.

Today, a solid maintenance philosophy considers the optimal mix of preventive, predictive, condition based and run-to-failure maintenance procedures for the most cost effective life cycle performance of a facility to meet sustainability requirements. In DOD, this is referred to as Reliability Centered Maintenance (RCM). In short, billions of dollars worth of reconstruction effort are on the verge of failure because of a lack of host nation maintenance and operations capability. Provisions must be made to ensure that there exists a proactive facilities acquisition strategy as well as a long-term management system that plans, guides, acquires, and transitions the reconstruction effort to the host nation. The RCM philosophy is a good reference to provide guidelines that define acceptable maintenance and operational practices and strategies for sustainability equivalent to the U.S. DOD 2005 sustainment program known as DAES-S. It must be noted that RCM is a philosophy not a maintenance system but use of this philosophy is an excellent overall way to provide maintenance services to new facilities.

The RCM philosophy, according to John Moubray, comes with its own new set of paradigms. The paradigm shift runs a close parallel to the contracting shift to performance and function based metrics versus the traditional metrics of the past. By way of example, instead of using the old paradigm of “maintenance is about preserving physical assets,” it is now presented as “maintenance is about preserving the functions of assets.” Similarly, it is no longer just about “preventing failures,” it is about “avoiding, reducing, or eliminating the consequences of failures.” Within the context of the RCM philosophy, a facility should be operated and maintained at the same or higher level than for which it was originally designed and constructed with due consideration to the risk associated with the facility management contract and the relative cost (Hansen, 2002).

Recent events at Walter Reed Army Medical Center and at numerous Veterans Administration facilities throughout the country highlight the importance of a proactive maintenance program. The old adage of “Pay me now or Pay me later” has come to fruition. The importance of maintenance on facility operations is clear, and that is to consistently maintain quality customer experiences without the depletion of resources and to promote safe and healthful surroundings that are reliable and serviceable in all situations.

In the context of acquisition for reconstruction projects, the implication of sustainable development on post-construction responsibilities is of paramount importance. Although many of the RCM principles are applicable to any well-operated facility, they take on significant importance in order to meet the purpose and demands of long-term sustainability in a total life-

cycle context. To a host nation embarking on a maintenance effort this would be an excellent approach to meeting the needs of the facility and the needs of the customers.

In acquisition, the planning, design, and construction of a facility affects its total life-cycle operation and maintenance (Sapp, 2007). The needs and concerns must be incorporated early on in the planning, design, and construction efforts since, according to a rule of thumb, at the 35% design stage of a project, 95% of the total life-cycle costs are fixed. Statistically, 38% of the total life-cycle budget will be spent on maintenance activities. If a host nation cannot support the design, it is best to know about it early in the process.

Some general considerations that can enhance the success of reconstruction projects include having facilities designed using appropriate technology necessary to meet their functional needs. Simplicity of design and construction will reduce maintenance costs and maximize operational efficiency for the staff. Materials chosen should meet all local and national occupational safety and public health service guidelines for health and toxicity standards. Adherence to safety and accessibility considerations is of particular importance in sustainable design to avoid post-construction redesign to correct deficiencies or improve standards. The goal is to design correctly the first time to avoid unnecessary maintenance and replacement at a later date.

In a general maintenance context, the planning, design, and construction of a sustainable development are based on sound engineering practices. In the reconstruction arena, it is advisable to critique and fine-tune the final product for operational sensitivity before the site is turned over to the host nation facility manager for maintenance. It is even more imperative that a training program be developed to ensure that the maintenance workers and managers are fully capable of operating and maintaining the new facility. During the life of a facility designers rarely have the opportunity to revisit the site to provide direction for maintenance activities. Over time, the collective and cumulative effects of maintenance and operations may diminish the soundness and sensitivity of the development unless appropriate maintenance practices are defined before facilities are opened for use.

From a maintenance standpoint in a reconstruction program, the differences between sustainable design and non-sustainable design are critical to the acquisition process. In a sustainable design the focus should not only be on the use of durable materials, low energy consumption, operational capabilities with the ultimate goal of lower operational costs, higher customer satisfaction, but also on a proactive maintenance program.

The operations and maintenance staffs should have a sense of commitment to the sustainable design and the base operations and support concepts for the designed facilities. If at all possible, they should be part of the early planning and development. The operations and maintenance staff must be trained to understand and communicate the sustainability principles for the facility. Sustainability must be visible in all aspects of the facilities operation, including utilities, waste handling, maintenance, production, and customer services.

Operations and Maintenance is key to successful Reconstruction and Vital Infrastructure projects, a key that is currently missing from the reconstruction acquisition venue. To correct this

fault, I recommend that training and staffing program be established for the maintenance personnel associated with each R&VI project tailored to development of host nation capability and development.

An essential goal of a quality, well-maintained sustainable development should be the hiring and training of the local population. During design and construction, individuals who excel in local artisan skills and show leadership potential should be identified. Upon completion of initial construction, the most qualified local artisans should be recruited and trained for future maintenance manager positions. The concept of total absorption of individuals into the design, construction, and maintenance steps constitutes sustainable personnel use, which complements sustainable development. A maintenance employee who was involved in initial design and construction would be likely to show a high level of pride in maintaining the facilities to the highest possible levels of quality.

Each employee should be cross-trained in major maintenance categories. The stratification of specialist employees should be avoided. Technical training should begin in the early phases of design and construction, and product manufacturers should provide hands-on training in preventive and cyclic maintenance before the facility becomes operational.

Author: Mr. Gregory Wojtkun



JCAF

APPENDIX A

Companies Participating in both Post-Conflict and Post-Disaster Efforts

Anteon Corporation	Artel, Inc.
Bechtel National Incorporated	Blackwater Lodge and Training
CACI Incorporated Federal	CDW Government, Inc.
CH2MHill Companies, Ltd	Chugach Support Services Incorporated
Cybex International Incorporated	Dataline Incorporated
Dell Marketing, LLP	DHS Systems Limited Liability Company
DynCorp International, LLC	Earth Tech, Inc.
EGL Incorporated	Environmental Chemical Corporation
Fluor Corporation	Force 3, Inc.
GTSI Corp	Harris Corporation
International American Product	Kellogg Brown & Root Services
KPMG, LLP	Kroll Ontrack, Inc.
Lab Safety Supply	Landstar Express America Incorporated
Michael Baker Jr., Incorporated	Motorola, Inc.
Outfitters Satellite, Inc.	Parsons Construction
Readiness Management Support, LLC	Red River Computer Co., Inc.
Science Applications International Corporation	Shaw Environmental & Infrastructure
Stanley Consultants, Inc.	Staples Incorporated
Total Business Incorporated	Triumph Technologies Incorporated
Unisys Corporation	URS Group, Inc.
WeCSYS, LLC	Weston Solutions Incorporated

APPENDIX B

USAID Indefinite Quantity Contracts (IQC) Contractors with Multiple Contact Areas

ABT Associates	Policy Reform; Community and Individual Behavior Change; Service Delivery; Training and Commodities; Operations and Applied Research.
ABT Associates	Provide country-level sector/sub-sector analysis, prog. design, implementation & evaluation services that stimulate sustainable agriculture & natural resource rural prosperity
ABT Associates	Macroeconomic Policy, Fiscal Tax Policy, Money, and Banking
ABT ASSOCIATES, INC.	Implementation of environmental health activities
Academy for Educational Development	Transition (FORECAST) - a fully integrated, flexible package of crosscutting services for Human and Institutional Capacity Development (HICD), including the next generation of Participant Training (PT).
Academy for Educational Development	Assistance to Basic Education/Education and Health
Academy for Educational Development	Associate cooperative agreements to NGOs in order to strengthen the planning and activity implementing capabilities of civil society organizations.
Academy for Educational Development	Instability, Crisis and Recovery Program (ICRP)
Academy for Educational Development (AED)	Possible activities included under this mechanism include messaging, advertising, crisis communications, media relations, events management, multimedia production, and information collection. TASC2 contractors also can provide assistance in sample design, data collection, processing, statistical analysis and reporting.
Academy for Educational Development (AED)	Policy Reform; Community and Individual Behavior Change; Service Delivery; Training and Commodities; Operations and Applied Research.

Academy for Educational Development (AED)	The purpose of this Hygiene Improvement Contract is to establish worldwide mechanisms to support the Bureau for Global Health as well as other USAID Missions and Bureaus.
Academy for Educational Development (AED)	Offers training and capacity strengthening assistance in the energy and environmental sectors.
American Institutes for Research	Assistance to Basic Education/Education and Health
American Institutes for Research	Assistance to Basic Education/Basic Education
ARD, Inc.	Sustainable Urban Management II
ARD, Inc.	Provide country-level sector/sub-sector analysis, prog. design, implementation & evaluation services that stimulate sustainable agriculture & natural resource rural prosperity.
ARD, Inc.	The Collaborative Research Support Program (CSRP) has been put into place to link the capabilities of the U.S. agricultural universities to the needs of developing nations worldwide.
ARD, Inc.	Commercial Legal and Institutional Reform Technical Assistance.
ARD, Inc.	To provide Analytical technical support and services in (1) core program support analytical services; and (2) core research and development services. Some of the functional areas included are: Political Science, economics, sociology, rule of law M&E Systems development, civil society strengthening, etc.
ARD, Inc.	To provide anti-corruption services in both political and bureaucratic offices. It will focus on unilateral abuses by governmental officials, as well as abuses linking public and private actors.
ARD, Inc.	Promote democratic governance in all states of political development.
ARD, Inc.	Instability, Crisis and Recovery Program (ICRP)
Associates in Rural Development	Integrated Water and Coastal Resources Management
Associates In Rural Development	Support Which Implements Fast Transition - II (SWIFT-II)

Associates in Rural Development, Inc.	Decentralization/Local Governance Strengthening Technical Assistance
Bearing Point	Macroeconomic Policy, Fiscal Tax Policy, Money and Banking.
Bearing Point	Asset Restructuring, Post Privatization role of Government.
Bearing Point	General Business, Investment, Commerce, Export and Trade
Booz Allen Hamilton	Macroeconomic Policy, Fiscal Tax Policy, Money and Banking.
Booz Allen Hamilton	General Business, Investment, Commerce, Export and Trade
Booz Allen Hamilton	Commercial Legal and Institutional Reform Technical Assistance.
CARANA Corporation	Asset Restructuring, Post Privatization role of Government.
CARANA Corporation	General Business, Investment, Commerce, Export and Trade
Casals and Associates	Support Which Implements Fast Transition - II (SWIFT-II)
Casals and Associates, Inc.	To provide anti-corruption services in both political and bureaucratic offices. It will focus on unilateral abuses by governmental officials, as well as abuses linking public and private actors.
CDM International Inc.	The purpose of the Environmental Health contracts is to establish worldwide mechanisms to support the Bureau for Global Health as well as other USAID Missions and Bureaus in the implementation of environmental health activities.
CDM International Inc.	Support USAID's Office of Federal Disaster Assistance (OFDA). Services must be for immediate short-term disaster relief with assistance in the areas of 1) Water, Sanitation, Health and nutrition; and 2) Food and Non-Food in response to international emergency requirements.
Chemonics International, Inc.	Policy Reform; Community and Individual Behavior Change; Service Delivery; Training and Commodities; Operations and Applied Research.
Chemonics International, Inc.	The contractor shall provide gender-related quick-response technical services and reports.

Chemonics International, Inc.	Technical assistance to promote economic growth and reduce long-term threats to the global environment.
Chemonics International, Inc.	Integrated Water and Coastal Resources Management
Chemonics International, Inc.	Provides technical assistance and services in support of the Famine Early Warning System Network. FEWS NET shall provide cost-effective access to technical expertise and implementation support to Washington and Mission Strategic Objectives (SOs) and to better address the evolving needs of the U.S. Agency for International Development (USAID).
Chemonics International, Inc.	Provision of financial services (enterprise credit, savings, insurance, etc) to microentrepreneurs
Chemonics International, Inc.	Asset Restructuring, Post Privatization role of Government.
Chemonics International, Inc.	General Business, Investment, Commerce, Export and Trade
Chemonics International, Inc.	Commercial Legal and Institutional Reform Technical Assistance.
Chemonics International, Inc.	Support Which Implements Fast Transition - II (SWIFT-II)
Chemonics International, Inc.	Promote democratic governance in all states of political development
Chemonics International, Inc.	Rule of Law Technical Services
Creative Associates	Assistance to Basic Education/Education and Health
Creative Associates	Assistance to Basic Education/Basic Education
Creative Associates	Support Which Implements Fast Transition - II (SWIFT-II)
Creative Associates International	Elections and Political Processes technical assistance
Democracy International, Inc.	To provide analytical technical support and services in (1) core program support analytical services; and (2) core research and development services. Some of the functional areas included are: Political Science, economics, sociology, rule of law M&E Systems development, civil society strengthening, etc.
Democracy International, Inc.	Elections and Political Processes technical assistance

Development Alternatives, Inc.	The contractor shall provide gender-related quick-response technical services and reports
Development Alternatives, Inc.	GDA Support Services
Development Alternatives, Inc.	Integrated Water and Coastal Resources Management
Development Alternatives, Inc.	Provide country-level sector/sub-sector analysis, prog. design, implementation & evaluation services that stimulate sustainable agriculture & natural resource rural prosperity
Development Alternatives, Inc.	Provision of financial services (enterprise credit, savings, insurance, etc) to microentrepreneurs
Development Alternatives, Inc.	Design, implement, and evaluate activities to help the poor to develop their businesses
Development Alternatives, Inc.	Develop policy papers, design microenterprise development interventions, develop and disseminate case studies.
Development Alternatives, Inc.	The Collaborative Research Support Program (CSRP) has been put into place to link the capabilities of the U.S. agricultural universities to the needs of developing nations worldwide.
Development Alternatives, Inc.	Macroeconomic Policy, Fiscal Tax Policy, Money and Banking.
Development Alternatives, Inc.	Support Which Implements Fast Transition - II (SWIFT-II)
Development Alternatives, Inc.	Decentralization/Local Governance Strengthening Technical Assistance
Development Alternatives, Inc.	Two functional activities are included under these contracts: a) decentralization and participatory government and b) public management and administration.
Development Alternatives, Inc.	Promote democratic governance in all states of political development
Development Alternatives, Inc.	Support USAID's Legislative strengthening programs by providing assistance to legislatures and other deliberative bodies
Development Alternatives, Inc.	Instability, Crisis and Recovery Program (ICRP)
DPK Consulting	To provide anti-corruption services in both political and bureaucratic offices. It will focus on unilateral abuses by governmental officials, as well as abuses linking public and private actors.

DPK Consulting	Rule of Law Technical Services
Financial Markets International, Inc.	Commercial Legal and Institutional Reform Technical Assistance.
Financial Markets International, Inc.	Support USAID's Legislative strengthening programs by providing assistance to legislatures and other deliberative bodies
IBM	Provision of financial services (enterprise credit, savings, insurance, etc) to microentrepreneurs
IBM	General Business, Investment, Commerce, Export and Trade
International Resources Group	Environmental policy technical advisory and assistance services
International Resources Group	Integrated Water and Coastal Resources Management
International Resources Group	Training, training management and advisory services to USAID for the design, development, and subsequent delivery of USAID staff skills training
International Resources Group	Training, management and advisory services for the delivery of a suite of courses including strategic planning, budgeting and program/project management, monitoring and evaluation
International Resources Group	Support USAID's Office of Federal Disaster Assistance (OFDA). Services must be for immediate short-term disaster relief assistance in the areas of 1) Water, Sanitation, Health and nutrition; and 2) Food and Non-Food in response to international emergency requirements.
Juarez & Associates	Assistance to Basic Education/Basic Education
Juarez and Associates, Inc.	The contractor shall provide gender-related quick-response technical services and reports
Management Sciences for Health (MSH)	The TASC2 TB IQC allows USAID missions to access technical assistance and programmatic support, among other areas, on all aspects of adapting WHO-recommended Directly Observed Treatment Short Course (DOTS) strategy in different settings.
Management Sciences for Health (MSH)	Policy Reform; Community and Individual Behavior Change; Service Delivery; Training and Commodities; Operations and

	Applied Research.
Management Systems International	The contractor shall provide gender-related quick-response technical services and reports
Management Systems International	General Business, Investment, Commerce, Export and Trade
Management Systems International	To provide Analytical technical support and services in (1) core program support analytical services; and (2) core research and development services. Some of the functional areas included are: Political Science, economics, sociology, rule of law M&E Systems development, civil society strengthening, etc.
Management Systems International	To provide anti-corruption services in both political and bureaucratic offices. It will focus on unilateral abuses by governmental officials, as well as abuses linking public and private actors.
Management Systems International	support USAID's Legislative strengthening programs by providing assistance to legislatures and other deliberative bodies
Management Systems International (MSI)	Develop policy papers, design microenterprise development interventions, develop and disseminate case studies.
Management Systems International, Inc.	Instability, Crisis and Recovery Program (ICRP)
Management Systems International, Inc. (MSI)	Promote democratic governance in all states of political development
Mendez England & Assoc.	Sustainable Urban Management II
Mendez, England & Associates (ME&A)	Integrated Water and Coastal Resources Management (IWCRM) IQC - Small Business Set-Aside Award
Nathan Associates	Macroeconomic Policy, Fiscal Tax Policy, Money and Banking.
Nathan Associates Inc.	General Business, Investment, Commerce, Export and Trade
PA Government Service	Environmental policy technical advisory and assistance services
PA Government Service	Integrated Water and Coastal Resources Management
PADCO	Support Which Implements Fast Transition - II (SWIFT-II)

PADCO	To provide anti-corruption services in both political and bureaucratic offices. It will focus on unilateral abuses by governmental officials, as well as abuses linking public and private actors.
PADCO, Inc	Sustainable Urban Management II
Research Triangle Institute	Sustainable Urban Management II
Research Triangle Institute	Decentralization/Local Governance Strengthening Technical Assistance
Research Triangle Institute	Two functional activities are included under these contracts: a) decentralization and participatory government and b) public management and administration.
Research Triangle Institute (RTI)	The purpose of the Environmental Health contracts is to establish worldwide mechanisms to support the Bureau for Global Health as well as other USAID Bureaus in the implementation of environmental health activities.
The Louis Berger Group	Macroeconomic Policy, Fiscal Tax Policy, Money and Banking.
The Louis Berger Group, Inc.	Sustainable Urban Management II
The Louis Berger Group, Inc.	Design, implement, and evaluate activities to help the poor to develop their businesses
The Mitchell Group	Assistance to Basic Education/Basic Education
The QED Group	Develop performance mgmt systems, provide admin. support for grant admin., and develop monitoring, and evaluations systems
The Urban Institute	Sustainable Urban Management II
The Urban Institute	Decentralization/Local Governance Strengthening Technical Assistance
The Urban Institute	Two functional activities are included under these contracts: a) decentralization and participatory government and b) public management and administration.
Weidemann Associates, Inc.	Provide country-level sector/sub-sector analysis, prog. design, implementation & evaluation services that stimulate sustainable agriculture & natural resource rural prosperity.
Weidemann Associates, Inc.	Develop performance mgmt systems, provide admin. support for grant admin., and develop monitoring, and evaluations systems.

REFERENCES

- Adams, Douglas. (1992). *Mostly Harmless*. Edinburgh, Scotland, UK: Harmony Publishing.
- Barnett, T.P. (2005). *Blueprint for action – a future worth creating*. New York: G.P. Putnam's Sons.
- Berg, Gerald. (2002), *Markets, Competition, and Industrial Analysis: Modern Views in a New Economy*, reprinted in ICAF 2007 Industry Studies Handbook. Washington: National Defense University.
- Bray, John, (February 2005), *International Companies and Post-Conflict Reconstruction Cross-Sectoral Comparisons*, Social Development Papers, paper No. 22.
- Brown, S., editor. (March 23, 2006). *Resourcing stability operations and reconstruction: past, present, and future*. Essays from the Dwight D. Eisenhower National Security Series Symposium. Washington: National Defense University.
- Conaway, Camille Pampell (August 2006). *Stabilization and Reconstruction Series: The Role of Women in Stabilization and Reconstruction*. Washington: United States Institute of Peace.
- Commission on Engineering and Technical Systems (CETS). (1991). *Pay Now or Pay Later: Controlling Cost of Ownership from Design Throughout the Service Life of Public Buildings*. New York: The National Academies Press.
- Copeland, Claudia; Mary Tiemann; and Nicole T. Carter. (2005). *Federal Disaster and Emergency Assistance for Water Infrastructure Facilities and Suppliers*. Washington: Congressional Research Service.
- Covey, J., Dziedzic, M.J., Hawley, L. (2005). *The Quest for Viable Peace*. Washington: United States Institute of Peace.
- Dearing, Tiziana. (August 2006) *Tiziana Dearing on Disaster Relief and Response*, interview text, www.ksq.harvard.edu/ksqnews/KSGInsight/dearing.html, Kennedy School of Insight, Harvard University. Accessed April 15, 2007.
- Department of Commerce (DOC). Iraq Investment and Reconstruction Task Force (IIRTF). homepage: <http://www.export.gov/iraq/index.html>. Accessed May 1, 2007.
- Department of Commerce (DOC). Iraq Investment and Reconstruction Task Force website. Business Climate section: http://www.export.gov/iraq/bus_climate/index.html. Accessed May 2, 2007.
- Department of Defense (DoD). Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. (2004). Defense Science Board, 2004 Summer Study, *Transition to and from Hostilities*.

Department of Defense (DoD). Office of the Under Secretary of Defense for Acquisition (May 20, 2005). *Memorandum for Secretaries of the Military Departments, Subject: Defense Acquisition Executive summary – Sustainment (DAES-S) Program.*

Department of Defense (DoD). (28 November 2005). *DOD Directive 3000.5. Military support for stability, security, transition, and reconstruction (SSTR) operations.* Washington: DOD.

Department of Homeland Security (DHS). (May 2006) *Quick Reference Guide for the National Response Plan.* Washington: DHS.

Department of State (DOS). (2005). *Post-conflict reconstruction.* Washington: Office of the Coordinator for Reconstruction and Stabilization.

Department of State (DOS). Website on U.S. Government Iraq Reconstruction: Information on Contracts. <http://www.state.gov/e/eb/cba/iraq>. Accessed April 15, 2007.

Dobbins, James; Seth G. Jones; Keith Crane; and Beth Cole DeGrasse. (2007). *The Beginner's Guide to Nation-Building.* Santa Monica: Rand Corporation.

The Economist. *A Billion Thirsts Quenched.* (August 28, 2004). Volume 372 issue 8390, p. 42. <http://exproxy6.ndu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=afh&AN=14268856&site=ehost-live>. Accessed March 20, 2007.

Facilities Sustainment, www.acq.osd.mil/ie/irm/Sustainment/default. Accessed March 2, 2007.

GAO report GAO-07-426T, Dated February 15, 2007, Subject: Rebuilding Iraq - Reconstruction Progress Hindered by Contracting, Security, and Capacity Challenges., Statement of David M. Walker, Comptroller General of the United States.

GAO report GAO-03-695, Dated June 2003, Subject: Military Operations – Contractors Provide Vital Services to Deployed Forces but Are Not Adequately Addressed in DOD Plans.

General Accounting Office. (June 2004). *Rebuilding Iraq: Resource, Security, Governance, Essential Services, and Oversight Issues.* Report to Congressional Committees. Washington: GAO.

Gwartney, James D.; Richard L. Stroup; Russell S. Sobel; and David A. Macpherson. (2006). *Economics – Public and Private Choice.* Mason, OH: Thomson Higher Education.

Hansen, F. W. (2002). *Guide to Facility Management Contracts,* 2nd Edition, Cambridge: Workplace Law Publishing.

- Harder, Ben. *A Safe Solution* in *Science News* volume 163 issue 9, p. 136. March 1, 2003.
<http://ezproxy6.ndu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=afh&AN=9200273&site=ehost-live>. Accessed March 20, 2007.
- Honore, R.L. and Boslego, D.V. (1st Quarter, 2007). *Forging provincial reconstruction teams*. Issue 44, *Joint Forces Quarterly*.
- McNeil, Donald G. *A \$3 Water Purifier That Could Save Lives* in *The New York Times*, October 10, 2006, p. F1. <http://exproxy6ndu.edu/login?url=http://proquest.umi.com/pdqweb?did=1142810311&Fmt=3&clientId=3921&RQT=309&VName=PQD>. Accessed March 20, 2007.
- McNerney, Michael J. (Winter 2005-2006). *Parameters* (pgs. 32-46). *Stabilization and Reconstruction in Afghanistan: Are PRTs a Model or a Muddle?*
- Montgomery, Maggie A., and Menachem Elimelech. *Water and Sanitation in Developing Countries: Including Health in the Equation*. Environmental Science and Technology volume 41 issue 1. http://pubs.acs.org/subscribe/journals/esthag/41/i01/html/010107feature_elimelech.html Accessed March 21, 2007.
- Moubray, John, Maintenance *Management – A New Paradigm*,
<http://www.maintenanceresources.com/referencelibrary/RCM/MaintParadigm.htm>, Accessed February 16, 2007.
- Nanotechnology Now. <http://www.nanotech-now.com/current-uses.htm>, Accessed Apr 15, 2007
- North American Industry Classification System (NAICS).
<http://www.census.gov/epcd/www/naics.html>. Accessed April 15, 2007.
- Orr, R. (Ed.) (2004). *Winning the peace: an American strategy for post-conflict reconstruction*. Washington: Center for Strategic and International Studies.
- Parsons. (2007). *Delivering Innovative Solutions*. Pasadena, CA: Parsons Corporation.
- Perito, Robert M. (October 2005). *Special Report: The U.S. Experience with Provincial Reconstruction Teams in Afghanistan*. Washington: Congressional Research Service.
- Playpumps. *900 Systems Installed*. http://www.playpumps.org/site/c.hqL_NIXOEKrf/B.2589383/K.42CD/Take_Action__Donate_Make_a_Donation.htm. Accessed March 20, 2007.
- Radvanovsky, R. (2006). *Critical Infrastructure. Homeland Security and Emergency Preparedness*. Boca Raton: Taylor & Francis Group.
- Sapp, D. (2007). *Facilities Operations and Maintenance*, Plexus Scientific, National Institute of Building Sciences. <http://www.wbdg.org/om/index.php>. Accessed May 22, 2007.

- Serafino, Nina M. (January 2007). *Peacekeeping and Related Stability Operations: Issues of U.S. Military Involvement*. Washington: Congressional Research Service.
- Singer, P.W. (2003). *Corporate Warriors: The Rise of the Privatized Military Industry*. Ithaca: Cornell University Press.
- Solar Solutions. <http://www.solarsolutions.info/aquapak/aquapak.html>. Accessed April 15, 2007.
- Thacker, Paul D. (August 4, 2004). *Low-tech Solutions for Pasteurizing Water*. Environmental Science & Technology. http://pubs.acs.org/subscribe/journals/esthag-w/2004/aug/tech/pt_lowtech.html. Accessed March 20, 2007.
- Tumwine, James K. (2005). *Clean Drinking Water for Homes in Africa and Other Less Developed Countries*. <http://www.bmjjournals.com/cgi/content/full/331/7515/468>. Accessed April 30, 2007.
- United Nations (UN). *International Committee on Intervention and State Sovereignty*. <http://www.iciss.ca/report2-en.asp#environment>. Accessed April 15, 2007.
- United Nations (UN). *World Population Projections to 2300*. <http://www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf>. Accessed May 17, 2007.
- U.S. AID. Assistance for Iraq. Contracts homepage: <http://www.usaid.gov/iraq/contracts>. Accessed April 15, 2007.
- U.S. AID. Website on Afghanistan and Restoring Infrastructure: http://www.usaid.gov/locations/asia_near_east/countries/afghanistan/infrastructure.html. Accessed April 30, 2007.
- United States Government (USG). (December 14, 2005). *US Government Draft Planning Framework for Reconstruction, Stabilization, and Conflict Transformation in United States Joint Forces Command J7 Pamphlet*. www.crs.state.gov. Accessed March 28, 2007.
- United States Government (USG). (March 2006). *The National Security Strategy of the United States of America*. Washington: GPO.
- United States Government (USG). *Special Inspector General for Iraq Reconstruction Report*. <http://www.sigir.mil/>. Accessed May 1, 2007.
- The White House. (December 7, 2005). *National Security Presidential Directive/NSPD-44*. <http://www.fas.org/irp/offdocs/nspd/nspd-44.html>. Accessed May 17, 2007.
- Williams, G.H. (2005). Engineering peace. The military role in post-conflict reconstruction. Washington: The United States Institute of Peace Press.